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Exploring recent long-distance passenger travel trends in Europe

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Abstract

This paper reviews recent trends in long-distance passenger travel in Europe. Its purpose is to explore whether some early signals for peak travel in long-distance transport can be identified and if so, which could be the options for a consistent policy action. For the sake of simplicity, only car and air modes are considered.

The analysis is based on previous research conducted for the preparation of the recent report of the European Environment Agency (EEA), "Focusing on environmental pressures from long-distance transport - TERM 2014" (EEA, 2014). Passenger travel demand data at the national level show striking differences among European countries. Beyond the traditional divide between "new" and "old" EU member states, it seems that differences respond to a much richer variety of traits, including the size of the country, per capita GDP trends and the characteristics of the population. It is within this complex geographical background that the influence of three traditional key drivers should be explored: population, disposable income and lifestyles.

Although there are good arguments to conclude that peaking in long-distance transport demand could be reached in an increasing number of European countries, there are also significant forces to further expand demand. Furthermore, it is worth highlighting that peaking, if materialised, would be happening at levels too high to be compatible with GHG emission reduction targets.

The paper concludes that there are positive signs in the recent trends of these drivers indicating that they would not result in additional mobility demand. However, these trends could be neutralised by other factors, such as the strategies of European transport policy makers and operators to foster latent demand and expand their markets, this is illustrated by current strategies of air travel operators and some regional governments to further develop low-cost, regional airport-based services.

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1. Introduction

Since the late 2000s, there has been growing discussion on the possibility for industrialized countries to reach a peak (or rather a plateau or asymptotic value) in the total annual distance travelled per capita, particularly for car users. Millard-Ball & Schipper (2010) were among the first to describe what is now known as "peak car travel", with a descriptive analysis of cross-national passenger transport trends in six industrialized countries, showing that total activity growth had halted relative to GDP in all of them. OECD/ITF (2014) provided a general discussion, highlighting the increasing heterogeneity among potential car users, the uncertain social and economic conditions, and the loss of attractiveness of car ownership as as possible contributors.

Considering lifestyles, one of the aspects that have received more attention is the expanded use of information and communication technologies (ICT). ICTs can be considered not only as a source providing activities that makes travel less attractive, but as a new accessibility tool on its own, which could become a virtual, new "transport mode" on its own (van Wee, 2015). However, the validity of arguments sustaining that ICT can act in both directions, either inducing further demand or replacing current trips, has not been challenged by the evidence collected yet (Mokhtarian, 2009).

Many authors, including most of the contributions to OECD/ITF (2014), have assumed that peak-car should mainly be associated to urban travel, due to changing daily mobility patterns in cities. However, national statistics for passenger-km travelled (PKT) also include intercity, long-distance trips. The share of long-distance in total obviously depends on the definition of "long-distance", which usually varies between 50 km and 100 km. Petersen et al (2009) estimate a share of 55% for trips (all modes) over 100 km in Europe; Emisia (2013) reduces this percentage to 20%, considering only travel beyond 300 km. Grimal (2010) provides an estimate of 40% for trips longer than 80 km, based on the French 2008 National Transport Survey (NTS). Dargay & Clark (2010) described long-distance travel patterns in UK, and estimated that 31% of all the distance travelled and 29% of all the distance travelled by car, could be attributed to trips over 80 km. In spite of the different figures, it can be concluded that long-distance travel for cars and for all modes taken together, constitutes a significant share of total PKT.

From an environmental perspective, two main reasons can be highlighted. The first one refers to the local impact of transport activities in the vicinity of busy transport infrastructure, such as main terminals (airports and rail stations) or rail and motorway sections. The second one is related to the greenhouse gas (GHG) emissions of long-distance travel. Whereas the former requires detailed information about the physical and socioeconomic characteristics of the surroundings of major long-distance transport infrastructure, the latter can be associated roughly to available statistics on total traffic volumes. Current mitigation strategies, as stated in the EU's roadmap towards a low-carbon economy (EC, 2011a) and in the Transport White Paper (EC, 2011b) are based on studies that forecast significant demand growth until 2030 and beyond; should some kind of peaking materialise, this could be taken as factual evidence that economic growth would not be necessarily coupled to transport demand in advanced economies. This would be a dramatic change compared to the current European approach, which explicitly dismisses any active demand management actions (EC, 2011b, §18).

The paper makes use of transport statistics, as compiled by Eurostat, and some indicators based on these statistics, as presented in the European Commission's statistical pocketbook (EC, 2015) and the EEA Transport and Environment Reporting Mechanism (TERM) (EEA, 2014). Information is analysed at the EU and national level and, for air transport, also at the regional (NUTS2) level. These sources include performance (PKT) figures for car travel, although without any split by distance, and passenger figures for air travel. (EC, 2015) includes an estimate of national and intra-EU air travel performance, in order to facilitate comparison of modal share with other modes.

Figure 1 provides an indication of trends in passenger transport performance by mode for intra-EU (including domestic) travel. It is well known that car trips remain the bulk of passenger transport (INTRA-EU), even if the levels in figure 1 are reduced to the 29% estimate suggested by Dargay & Clark (2010) for the UK, and that figures have substantially stabilised after 2004. Air transport suffered the most from the economic crisis since 2008, but has recovered now at pre-crisis levels; it remains however unclear whether its performance will stabilize at current levels or pre-2007 growth will be resumed. Figure 1 also illustrates recent changes in the relationship between GDP and intra-EU passenger transport demand (see EEA, 2014 for a more detailed discussion), including the intensity (i.e. the PKT per unit of GDP) for car and air transport. The general trends suggest that intensity would be slowly declining for car travel since at least 2000, and could have started to decreased for air travel since 2005.

The paper is organised as follows. Section 2 describes the methodological approach; section 3 reviews recent trends in air and car passenger transport in the EU, and the available evidence for the "peaking" case; section 4 discusses the potential changes in key transport demand drivers suggested by the previous analysis; section 5 discusses the policy implications and the main conclusions and need for further research.

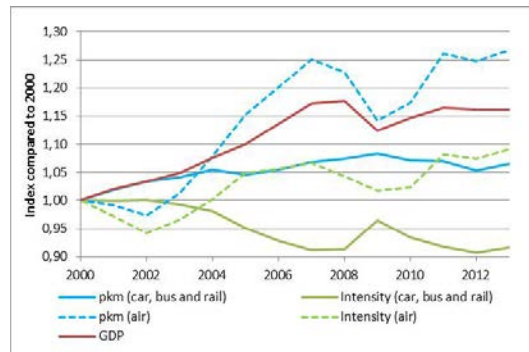


Fig. 1. Trends in transport intensity (PKM/GDP) in EU-28 (2000 = 1).

2. The methodological approach

Considering the relative importance of the various modes, and their recent trends, the analyses only covered passenger travel, as the key trends in long-distance passenger mobility in Europe could be captured with these two modes: car travel remains the main mode for trips beyond 100 km, and air travel has been the most dynamic mode, attracting an increasing number of passengers in the last two decades. Bus trips have not substantially varied for many years, and rail growth is mainly happening in the few high speed rail corridors in operation in Europe.

The literature review focused on the emerging trends in travel demand, and their main drivers in Europe, and was followed by different analyses of available EUROSTAT statistics for car and air travel. The indicator chosen to find evidence on peak-car travel was the average annual distance travelled by citizens in each European country. This was the approach of Millard-Ball & Schipper (2010) and followed by other authors since then. A major uncertainty comes from those countries which have peaked during the economic recession: these are only a small part of the total sample, and for them, a specific analysis was conducted in order to check whether changes compared to pre-crisis annual travel distances were below 0.5%. Another, more general source of uncertainty comes from the different assumptions for estimating average car occupancy across European countries. In many of them, average car occupancy is not surveyed often enough to identify changes: for example, the recent booming of ICT-based car sharing platforms for long-distance trips could be detected only through increasing occupancy rates, as changing traffic volumes would remain unaltered, or would even decrease.

The EUROSTAT statistics on tourism include some information on long-distance travel (annual data on trips of EU residents, *tour_dem*); the database provides information on trip purpose, mode and destination (domestic, EU, rest of the world), but distances are not included, and for most of the countries the harmonised time series available are too short for any meaningful analysis.

EUROSTAT does not provide information of total performance for air travel. The number of passengers at airports is the main information available. These passengers are classified by origin and destination and by some broad distance categories, but any estimate of performance based on those figures would require a good number of assumptions, beyond the exploratory scope of this paper.

As it happens for car travel, trends in passenger figures vary substantially from country to country. A first approach can categorise passengers by origin and destination (domestic, intra-EU and outside the EU). The respective shares can be analysed by countries, and trends can be followed at least for "old" member countries (EU-15) and "new" member countries (EU-12).

Passengers are also categorised by NUTS-2 regions, depending on the location of the airport or origin or destination. This allows identifying the main airport typologies, comparing passenger volumes with population in the region. High values for this indicator (number of passengers per inhabitant) can be associated to airports in major touristic destinations, to regions hosting major global hubs and also to regional airports with successful policies to attract new flights, particularly from low-cost carriers. Recent growth in total passenger volumes (2007-2012) can also serve to identify those airports that are leading air travel expansion in Europe.

3. Emerging trends in long-distance car and air travel

3.1. *Is peak-car affecting long distance travel?*

Dargay & Clark (2010) described long-distance travel patterns in Great Britain, and analysed their main drivers, using data from the 1995-2006 National Travel Surveys (NTS). The average annual long distance (80 km or more, one way) travel per capita was 2,662 km for car and 3,402 km in total: this would represent 29% of total car-km travelled and 31% of all distance travelled. They concluded that long distance travel would be strongly related to disposable income: air is most income-elastic, followed by rail, car and finally coach. Another conclusion from their review of past studies is that income would be an important factor in determining the quantity of long distance travel, with modal shares for air and rail increasing as income rises at the expense of car and coach. Finally, the high income elasticity of air travel would result in large increases in air travel.

Nicolas & David (2009) described long-distance travel patterns in France. Calculations are based on the 1994 NTS. Long trips (all modes) accounted for 40% of total distance, or 5,350 km per year and person, with 52% of them made by car, 29% by air and 11% by rail. Income level is considered as the main explanatory variable. They concluded that it is "long-distance mobility that has increased the most in these last years" (Nicolas & David, 2009, p. 1019). The authors' recommended the implementation of price-based policies as a way to curb demand growth, although taking into consideration also equity issues. Grimal (2010) provided a review of the 2008 French NTS. Cars account for 40% of the total distance travelled, and average annual growth between the former (1994) NTS and the 2008 NTS is clearly higher for rail and air (3,0 % and 2,5 %) than for car (1,4 %).

Kuhnimhof, Georg, Madre, & Collet (2009) made a general description of long distance travel in Europe, based on NTS from a few countries, results from the EU-wide DATELINE survey on long distance travel (data collected in 2001-2002), and some modelling exercises. They concluded that long-distance travel demand was higher in central and northern European countries than in the south. About two thirds of all long distance travel was made by car. The number of annual trips varies significantly from country to country: within the 100-400 km distance range, between 7.3 trips per year (Sweden) to 5.5 (GB), 5.1 (Germany) or 4.5 (France); the differences are lower in the distance range above 400 km: from 1.4 (Sweden) to 1.0 (Germany) 0.9 (GB, France); Southern Europe, at around 0.6 (Spain) to 0.2 (Portugal).

Petersen et al. (2009) estimated a significantly higher volume of long-distance travel in Europe, compared to the estimates for UK and France mentioned above. Trips beyond 100 km would account for about 55% of all passenger-km. This is consistent with the estimates made by the International Transport Forum with the MoMo model of the International Energy Agency: some 9,500 km per year and inhabitant for trips longer than 100 km in OECD countries (Cuenot, Fulton, & Staub, 2012; EEA, 2014; OECD/ITF, 2013).

Salomon & Singer (2014) examined informal travel and the role of ICTs in its expansion, based on the 2009 US National Household Travel Survey. They found some evidence that informal travel could be increasing, propelled by growing use of information and communication technologies.

The drivers of long-distance car travel are mainly related to holidays, friends and family: private purposes account for 80% of total trips, compared to 20% of business travel, in accordance with the French 2008 NTS (Grimal, 2010). This percentage is probably not homogeneous among countries: in accordance with EUROSTAT (tour-dem), and referring only to trips including one or more nights, in 2012 the percentage would vary from less than 5% for countries such as the Netherlands, and Greece to 10% for countries such as France and Spain, and to values close to or beyond 20% for Germany, Belgium or Poland. Decisions on long-distance travel would be influenced by the characteristics of the final destination and travel time (Limtanakool, Dijst, & Schwanen, 2006), besides the socio-economic characteristics of the travellers.

Figure 2 provides some evidence of peak car travel in Europe. The value and year of peak travel is indicated in yellow for each country; those countries for which there is no clear evidence of peaking are indicated in red. Within the former group, the decrease in annual car travel distance since the peak year has been modest, below 5%, with a few exceptions: 20% in Italy, 13% in Spain and 12% in United Kingdom. For the latter group, in a few countries recent growth has been extremely low (below 0.5% in total) since 2010 (Slovakia) or 2011 (Austria, Germany, Finland and Malta).

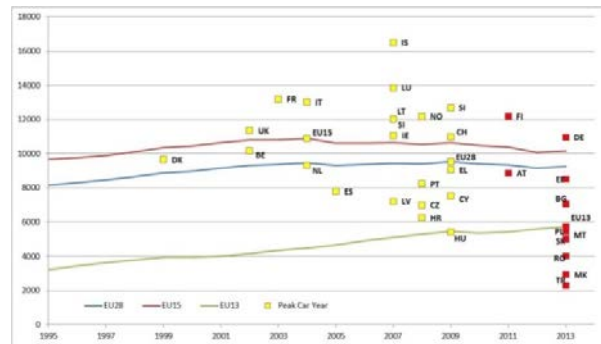


Fig. 2. Annual passenger-km per capita (Source: Eurostat).

There are difficulties to discern whether peak-car is associated to short or long-distance travel or to both. The situation probably differs from country to country. There is some evidence supporting the idea that long-distance car travel could be affected:

- For statistics collection, some countries (e.g. Portugal and Spain, which show significant lower peak figures than other countries) consider only traffic counts on sections outside cities. The peaking showed by the statistics could only occur if happening in long-distance trips.
- Considering the values of long-distance transport share presented above for some countries, it could be safe to assume that long-distance travel could represent between 29% and 50% of total passenger-km travelled by car. It seems difficult that any peaking could be achieved without a reduction also in long-distance car travel.
- Evidence on car use in cities do not show a decline throughout Europe big enough to explain peak-car compatible with a growth in long-distance car travel.

It can be concluded from this initial analysis that a good number of European countries have reached peak-car well before the economic downturn, and that peaking in total car travel performance would have been unlikely if relying solely on a reduction of car trips in urban areas. Current trends would suggest that annual distance travelled would be reaching a "plateau" rather than "peaking", without any evidence to decrease in future.

3.2. Is induced travel the main driver of air travel growth, and will it continue?

Allroggen et al (2013) analysed the impact on air traffic growth of the incentives offered by many airports. Airport charges contribute significantly to differences in operational costs among airlines, and airport managers may use charges as a means of attracting traffic to its facilities. They analysed a sample of 194 European airports, finding that incentives are a part of the charges-setting strategy of airports. Many other studies indicate that incentives for route and traffic development are widespread in Europe and in the United States (Fichert & Klopheus, 2011; Jones, Budd, & Pitfield, 2013; Malina, Albers, & Kroll, 2012).

Regional airports and their subsidies to operators could therefore constitute a major driver of air travel growth. Barbot (2006) analysed the case of Ryanair in Charleroi (Belgium). As Mancuso (2013) states, airport and air traffic fees are usually intended to cover infrastructure costs in full, but airlines may be offered a range of incentives for operating at certain airports or serving certain destinations, and some airports may receive state aid from public

Figure 3 provides some figures from airports with an indicator value above 2 passengers per inhabitant, and with growth between 2007 and 2012 above 19%. The conclusion is that there are many regional airports rapidly expanding, that only a few "traditional" airports are growing (Vienna, Zurich, Oslo), and for this latter group, it could be likely that low cost (i.e. induced traffic) growth seems to be the main driver: further research on airport charges and incentives could clarify the validity of this claim. According to Figure 3, airports leading growth in Europe would include airports in Eastern European capitals, traditional airports with an aggressive low-cost policy, emerging regional airports, with a strong low-cost component and some regional hubs that may be benefiting from growth in their area of influence.

Air passenger statistics show that EU-12 and EU-15 are following different patterns in air travel growth, with intense growth in the former and moderate growth in the latter. It is worth noticing that there are further differences among countries within EU-15 with Nordic countries growing faster than Southern countries. The main growth in passengers is associated to travel outside the EU, whereas domestic travel is declining and intra-EU travel is growing at a much slower pace, at least since 2007. These trends are also consistent with changes in the split of passengers according to destinations in the EU: passengers in national flights account for 13% of the total, and are losing share; the share of intra-EU passengers is stabilised at 59% of the total, and passengers with origins or destinations outside the EU account for 28% of the total, and are increasing their share.

EUROCONTROL (2014) recently reviewed trends in the various market segments in Europe, concluding that the EU air market was achieving maturity, so that only limited further growth could be expected for intra-EU travel, and also moderate growth for extra-EU trips. Previous forecasts had been much more confident about further air travel growth: Alonso et al. (2014) reviewed the distribution of air demand in EU countries, forecasting further growth, coupled to economic development (GDP). In the EU, the distance segment between 500 and 1000 km has more flights and passengers than larger distances. Traffic would grow away after 2016 and at least until 2030 at a healthy 1.0-2.0% for intra-EU and 2.0%-2.5% for extra-EU (pessimistic scenario). The analysis of passenger flights shows that the traffic is very concentrated on short distances below 1000 km (almost 60% of the flights and 46% of the passengers), despite the broad availability of surface transport alternatives (Alonso et al, 2014, p.92).

It can be concluded that powerful drivers remain active to keep long-distance travel growing: even if the absolute number of passengers stagnates, there are good arguments to sustain that the distances travelled will keep growing, with trips outside the EU replacing current domestic and intra-EU trips, mainly in the leisure segment (Eurocontrol, 2014). Nevertheless, these growth trends are mainly sustained by the industry strategies to induce additional demand for travel. From this perspective, there is a case to consider a revision of current regulation, on environmental grounds, to curb future demand growth. Facing uncertain market trends, air carriers in Europe will probably have no choice but to further induce demand to preserve their profitability. However, this strategy could be reaching its limits, at least for intra-EU travel.

4. Any changes expected in the drivers of long-distance travel?

Long-distance travel is traditionally considered as a desirable activity, both in the leisure and business segments. The substantial literature available on drivers of long-distance travel demand (see section 3) agrees in the relevance of population and disposable income on the demand side and technological progress, on the supply side, as key drivers. Lifestyles would also play a significant role. Traditionally, drivers from the demand and supply side have worked together as the basis of historical transport growth trends: more people, willing to travel more and to farther destinations making use of cheaper, quicker and more comfortable transport means.

A justification of any substantial deviation from this ever-growing trend (as is the case for peak travel signals revised in section 3) could be substantiated by changes in any of these drivers. In this section, recent trends in population and income levels will be explored, as well as changes in lifestyles that could move away from the traditional view of long-distance transport as a desirable activity. Finally, the prospects from the supply side to continue providing ever cheaper, faster transport services are briefly discussed.

Population trends in Europe have traditionally been considered as favourable to further transport demand growth (in total and on a per capita basis) on the ground of expected absolute growth, and increasing travel patterns in old age categories, and particularly among the elderly (e.g. Petersen, et al., 2009; Sessa & Ennei, 2010) (Figure 4).

These different trends, particularly in the last decade, would suggest that absolute population growth would be moderate in EU-27, but this could be compatible with disparate situations: more vigorous growth in some countries with already high long-distance mobility patterns (such as Scandinavian countries), and absolute decline in countries with fast-increasing mobility behaviour (EU-12). The picture looks even more uncertain when migration is considered as one of the key drivers of population growth in Europe. At any rate, it can be stated that population trends will become even more decisive for transport demand researchers in the years to come.

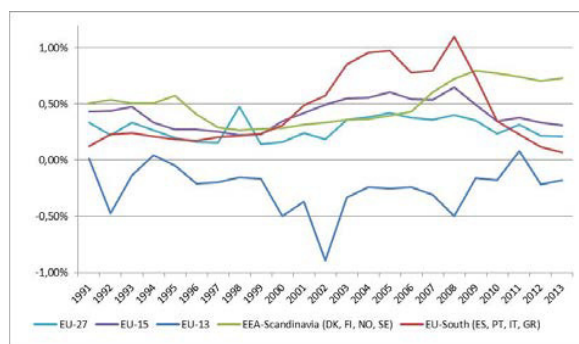


Fig. 4. Annual changes in population in Europe. (Source: EUROSTAT, EEA, 2014).

The relevance of economic growth to shape future long-distance transport demand is also uncertain. Figure 5 summarises median income for different groups of European countries. With the exception of Scandinavian countries, it could be concluded that disposable income has not varied significantly in the last decade in Europe, and could not influence long-distance travel demand significantly. Prospects on future trends in disposable income are the object of much debate in Europe these times, with some scholars arguing about increasing disparities and no significant gains in income for the population in the lower quintiles.

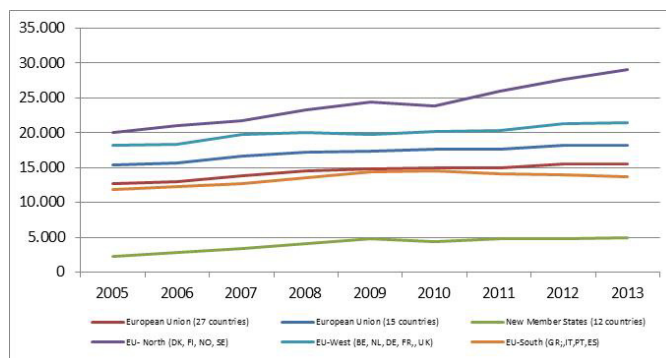


Fig. 5. Median income in Europe (EUR per year). (Source: Eurostat).

A third driver of long-distance transport demand refers to lifestyles. There are still no clear signals about the impact of ICTs on transport demand, particularly for long-distance travel. The evidence available merely states that new options are available now, and are consolidating their attractiveness among Europeans, particularly the young generation, offering travel-free alternatives to conduct leisure and business activities. This could result in some reduction in travel demand. Although the rebound effect of additional trips due to the improved opportunities for social and economic interaction provided by ITCs could not be totally dismissed, it seems to be losing potential.

In the absence of clear signals for significant travel growth from the demand side, supply would become the basic driver to induce further long-distance mobility. Future demand growth would be relying on the ability of suppliers to keep their product desirable and affordable to a growing number of users, in order to induce further demand. Whether this strategy remains viable for the future is questionable.

The transport data available provide ground to claim that significant changes could be happening in passenger demand, and that in future the supply side could become more relevant than the traditional socio-economic drivers of travel. The growing influence of ICTs is already now generating some response from the car industry: from automatic driving to integration of ICT-related services within car features, there is an array of attempts for shaping the car experience to the new profile of users. For air travel, the race to low prices does not seem to have reached the bottom, and low-cost strategies for middle-range destinations could be transferred to the long-range segment.

Regulators would be facing a major challenge under this new scenario. In the past, deregulation and lack of action to curb demand were justified on the grounds of not interfering with the needs of economic growth (EC, 2011b). In future, transport demand expansion would be less a consequence of economic growth and populations' choices than the narrow objective of an industry desperately fighting to increase its market. There are good reasons justifying a change in policy from the government side: from the attainment of GHG emission reductions to the desirability of dedicating scarce economic resources to more productive activities than inducing further travel.

Nevertheless, it must be reckoned that some other trends could change this picture. Migration trends is a major source of uncertainty, and a possible source of future long-distance travel demand growth.

5. Conclusions: The scope for policy action and the research agenda

Although there are some signs of change in the traditional trends of long-distance travel, it is uncertain to what extent these signs will consolidate in the future. At any rate, it seems that the times when planners could take demand growth as a given, almost natural trend are gone, and that there is a need to revise the drivers under the emerging trends and the new opportunities they may offer for policy action.

Even under a scenario of "peak travel", total long-distance passenger demand may keep growing, following population trends, but only in some regions in Europe, particularly in the north, and could be further strengthened by global migration flows. Peak travel could hardly be considered as a justification to weaken current EU efforts to decrease GHG emissions: bold action in the field of technological innovation will remain needed.

Peak car travel is materialising in many European countries, mostly "old" EU members, but there are others still far away from those peak-car levels, and substantial further demand growth could be expected from them. This is a significant source for future mobility (and emissions) growth in Europe as a whole, and a reason to question whether peak travel must necessarily be achieved at current high levels and cannot be reduced. Thus far, there have been no signs of significant reduction in mobility levels once peak car travel has been achieved, and this would mean that car use would remain at unacceptable high levels.

Air travel keeps growing at a significantly high rate, but mainly for extra-EU trips. In the absence of growth in disposable income, the growth in air travel can be primarily associated to the availability of low fares for leisure travel to far-distant destinations and the generalisation of point-to-point low cost services within Europe. Although these airlines' practices result in a widened availability and choice of low-cost destinations for business and leisure, they also foster induced demand, with negative environmental impacts.

There is a case to further reflect on the medium and long-term sustainability of current air travel trends and practices. Better regulation (as intended, for example, for public aid to regional airports) could facilitate the sector to move away from current strategies to stimulate demand, and align prices with the full costs of air travel. Although the recent failure of the ETS scheme in aviation is certainly a discouraging sign, there is a need for exploring alternative ways to manage the current "race to the bottom" in air travel competition.

New lifestyles can be at the root of some of the new trends in long-distance travel, but it is too soon to say so and it seems unlikely that, in the absence of bolder demand-management policies from governments, these changes will be quick and deep enough to substantially curb current demand levels and their associated GHG emissions. Action of governments is further justified on the basis of past and present strategies of transport operators and other stakeholders to further boost induced demand. In conclusion, good reasons remain for implementing mobility management policies, and to also target air travel within those policies.

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